

High Efficiency Laser for Aircraft/UAV and Space Lidar Missions, Phase II

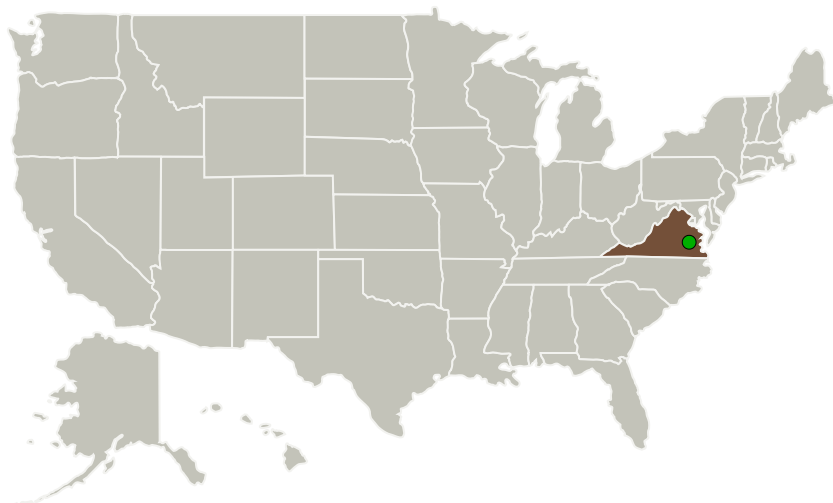
Completed Technology Project (2011 - 2013)



Project Introduction

This SBIR is developing high-efficiency, high beam-quality Nd lasers and non-linear wavelength conversion technologies suitable for ozone, aerosol, oxygen, CO₂, water vapor and wind lidar. The advanced solid-state laser technology proposed directly supports NASA Earth Science Decadal Study programs for aerosols and clouds (ACE), global wind (3D-Winds) and advanced multi-beam altimetry and vegetation canopy missions (DESDynI, LIST). We propose to increase the wall-plug efficiency of fieldable 1 μ m lasers from 4-6% into the 12-16% range, drastically reducing the electrical power needed for satellite missions. For the same satellite bus this means that power will be available to support another lidar system, radar or other instruments - greatly increasing the science mission value. The closely related non-linear wavelength conversion technology can also enable direct range-resolved CO₂ measurement and/or oxygen lidars that support CO₂ pressure and density determinations. The technology developed will also support sub-orbital flight missions for ozone, water vapor, and High Spectral Resolution Lidar (HRSL) systems for advanced aerosol measurements.

Primary U.S. Work Locations and Key Partners



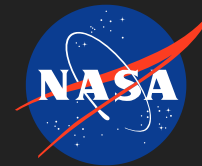
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Organizations Performing Work	Role	Type	Location
Fibertek, Inc.	Lead Organization	Industry	Herndon, Virginia
● Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations

Virginia

Project Transitions



June 2011: Project Start



June 2013: Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138911>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Fibertek, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Floyd Hovis

Co-Investigator:

Floyd Hovis

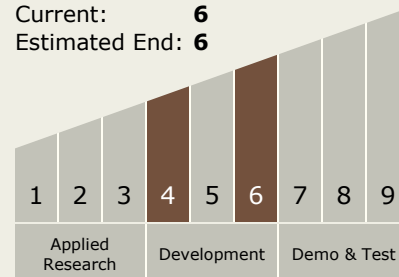
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Technology Maturity (TRL)

Start: 4
Current: 6
Estimated End: 6



Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.5 Lasers

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System